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is an entire constant quantity. Hence

$$\frac{dP}{dx} = n\,Q;$$

$\therefore dP = n\,Q\,dx$. Dividing this equation by (1) member by member we have

$$\frac{dP}{\sqrt{1-P^2}} = n\,\frac{dx}{\sqrt{1-x^2}}.$$

10. "The Chief Justice of a court makes a large number of legal decisions. Afterward it is found that 50 per cent. of these decisions are erroneous. Required to determine the legal knowledge of the Judge."

SOLUTION BY PROF. A. HALL.

If we assume the Judge to be an honest man, and divide the decisions into two classes, viz: right and wrong, it follows from the conditions given and the calculus of probabilities that such a Judge is a perfect legal ignoramus. This result is simple enough, and yet decisions and predictions of this kind not infrequently form the basis of extended reputations, ex. qr in the case of weather prophets, fortune tellers, &c. We forget that one ought to guess right half the time. Some of this delusion may be seen also in the cherishing of astronomical fancies and analogies, and the straining of facts to conform them to these analogies.

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PROBLEMS.

16. What are the sides of a right angled triangle the area of which is 5 acres, and one of its acute angles 22° 30′?—Communicated by Joseph B. Mott, Neosho, Mo.

17. Find the sum of the series

$$a\,r^n + (a+b)\,r^{n-1} + (a+2\,b)\,r^{n-2} + \ldots (a+n\,b) = S.$$

—Communicated by James Stott, Esq., Carbondale, Pa.

18. Find the differential coefficient of the function $(1+x^m)^n \,.\, (1+x^n)^m$ and express the answer in its simplest form.—Communicated by Philip Hoagland, Newcomerstown, Ohio.

19. Referring to Question 4, (No. 1): At what time will the lower cask contain the greatest quantity of wine?—Communicated by Prof. Geo. R. Perkins.